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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/008,623	12/06/2001	Malcolm R. Schuler	90065.161701	3753

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Thomas R. FitzGerald , Attorney
Reynolds Arcade Bldg
Suite 210 16 E Main Street
Rochester, NY 14614-1803

EXAMINER	
MARKOFF, ALEXANDER	

ART UNIT	PAPER NUMBER
1746	

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/008,623	SCHULER ET AL.	
	Examiner	Art Unit	
	Alexander Markoff	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 June 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13-15 and 27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13-15 and 27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 13-14 and 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The applicants amended the claims 13-14 to recite "wave fronts" and the direction of movement of the wafers being perpendicular to the direction of travel the waves and to the "wave fronts".

This concept is not supported by the original disclosure.

Moreover, the claims are not enabled because there is no a single direction which is perpendicular to both the direction of the travel of the waves and the surface which is perpendicular to the direction of the travel of the waves. Any direction that is perpendicular to the direction of the travel of the waves would be parallel to the surface, which is perpendicular to the direction of the travel of the waves.

Response to Amendment

3. The amendment filed 2/2704 is again objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

The applicants amended the claims to recite "wave fronts" and the direction of movement of the wafers being perpendicular to the direction of travel the waves and to the "wave fronts".

This concept is not supported by the original disclosure. See explanation above.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 15 is rejected under 35 U.S.C. 102(b) as being anticipated by Skrovan et al (any one of US Patents 5,849,091 and 6,048,405).

Skrovan et al teaches a method as claimed. See Figures 1 and 2 and the related description.

The method comprises immersing wafers in a holder into a tank with a cleaning liquid and generating megasonic waves with transducers 24. It is inherent that the generated waves would be intercepted and dispersed by part 34 and by gas bubbles 36 introduced during the cleaning.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 13-14 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al (US Patent No 6,085,764) in view of Handbook of Semiconductor Wafer Cleaning Technology (HSWCT).

Kobayashi et al teaches a method as claimed except for generating of two sets of waves and the use of megasonic frequency. See entire document, especially Fig. 1 and Description of the Preferred Embodiment.

Kobayashi et al teach the use of ultrasonic cavitation for cleaning.

The HSWCT teaches (page 141) that ultrasonic cavitation can cause a surface damage. The document recommends the use of megasonic waves produced by arrays of megasonic transducers to avoid the surface damage.

It would have been obvious to an ordinary artisan at the time the invention was made to use an array of megasonic transducers instead of the ultrasonic vibrator 12 in the method of Kobayashi et al in order to prevent damage from ultrasonic cavitation with reasonable expectation of success because the HSWCT recommends that.

As to newly introduced limitation of claims 13 and 14:

It is noted that in the method of Kabayashi et al the wafers are moving in the same direction as disclosed in the instant disclosure. At the same time the wafers are moved in the vertical direction, which is perpendicular to the wave fronts.

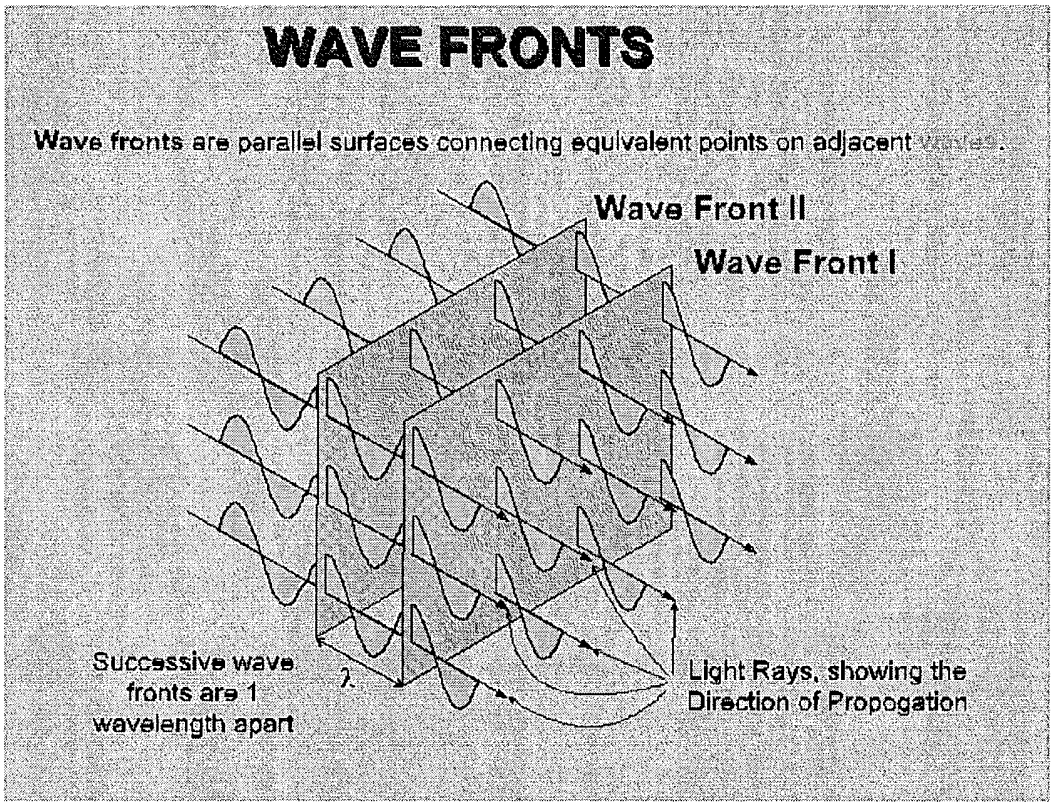
Response to Arguments

10. Applicant's arguments filed 6/24/04 have been fully considered but they are not persuasive.

The applicants argue that the rejection of 13, 14 and 15 under 35 USC 112(1) is not proper. The arguments are not persuasive because the applicants in their arguments interpreted "wave fronts" as a direction. The "wave front" is not a direction. Such interpretation contradicts to the meaning of the term. See the definition from the Merriam Webster dictionary presented by the applicants (page 6, lines 15-18 of the Remarks). The original disclosure is silent regarding the "wave front". The original disclosure does not redefine the term.

For better visual presentation the definition of the term from http://www.brocku.ca/earthsciences/people/gfinn/optical/wavefron.htm is presented here:

1. Wave front - parallel surface connecting similar or equivalent points on adjacent waves.
2. Wave Normal - a line perpendicular to the wave front, representing the direction the wave is moving.
3. Light Ray is the direction of propagation of the light energy.



The applicant's attention is directed to the fact that any direction, which would perpendicular to the direction of travel of the waves (Direction of Propagation on the Figure), would be in the surface defined as Wave Front. Thereby, there is no a direction which is at the same time perpendicular to the direction of travel waves and to the wave fronts.

The applicants argue that the rejection of claim 15 under 35 USC 102 over Skrovan et al is not proper.

The arguments are not persuasive because it is inherent that the generated waves would be intercepted and dispersed by part 34 and by gas bubbles 36 introduced during the cleaning.

The part 34 and the bubbles are positioned between source of the waves and the wafers in the holder. This is the same as required by the claims and is the same as shown in the Figures 8 and 9 of the instant application. Whether or not Skrovan et al explicitly state that waves would be intercepted and dispersed by part 34 does not change the fact that the waves would be intercepted and dispersed by the part.

The applicants argue that the position of the part 34 is not critical and that the part can be placed at a number of different places. This is not persuasive because at least at the presented Figures the part is placed between the source of the waves and the wafers in the holder. It means that operation of that embodiment anticipates the claimed method. Whether or nor all the embodiments of Skrovan et al anticipate the claim is not relevant.

The applicants argue that the rejection of Kobayashi et al is not proper because the document teaches only minutely vibration of the wafers relative to each other.

This is not persuasive because the direction of the vibration (movement of the wafers is the same as claimed. See Figure 1 wherein the referenced direction and its relations with the direction of the waves and the wafer are clearly shown.

The discussion regarding the "wave front", which is presented above, is applicable to this argument as well.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Markoff whose telephone number is 571-272-1304. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alexander Markoff
Primary Examiner
Art Unit 1746

am

ALEXANDER MARKOFF
PRIMARY EXAMINER